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Proposed Semiconductor Film Improvement

The problem:

Semiconductor compounds produced by reaction of Group II metalorganics and Group VI hydrides or Group III metalorganics and Group V hydrides in an H_2 gas environment contain impurities and defects which lower the mobility and lifespans of carriers in the film.

The solution:

Low impurity and high mobility are obtained when the film is grown in an inert carrier such as helium, argon, or nitrogen. Additional improvements in film quality include film annealing steps that are to be used in the film growing process.

How it's done:

Production of semiconductor compounds by reaction of Group II and III metalorganics and Group V and VI hydrides, respectively, has been conducted in an H_2 gas environment. Because H_2 has reducing properties, it introduces an undesirable amount of impurities in the film. Thus, H_2 should be replaced with an inert carrier such as helium, argon, or nitrogen to improve the quality of the film. This method will permit the film to be used for devices such as Gunn and LSA which require high quality standards.

Further improvements in the film crystal structure are obtained when film annealing steps are incorporated into the film growth process. These steps should be executed before the film exceeds the $10\text{-}\mu\text{m}$ thickness.

Note:

Requests for further information should be directed to:

Technology Utilization Officer
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Washington, D. C. 20546
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Patent status:

No patent action is contemplated by NASA.

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